



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/769,011

01/30/2004

Benjamin Y.H. Liu

M419.12-0043

7978

27367 7590 09/07/2007
WESTMAN CHAMPLIN & KELLY, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402-3319

EXAMINER

BUEKER, RICHARD R

ART UNIT

PAPER NUMBER

1763

MAIL DATE

DELIVERY MODE

09/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/769,011

Applicant(s)

LIU ET AL.

Examiner

Richard Bueker

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 11, 13 and 18-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12, 14-17 and 22-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>8/9/04; 8/31/05; & 12/27/05</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 1763

The restriction requirement between Groups I, II and III as outlined in the previous office action has been removed in view of the amendments to the claims filed May 16, 2007.

Claims 11, 13 and 18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on May 16, 2007.

Claims 2-4 and 7-10, 12 and 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 2 and 3, the phrase "the source providing a plurality of different gas or liquid" lacks proper antecedent basis and is unclear because claim 1 defines "a source of gas" and "a source of liquid" and it is unclear which previously defined source is being referenced in claims 2 and 3. In claim 2, the phrase "a plurality of different gas or liquid" is non-idiomatic and indefinite and should be changed to "a plurality of different gases or liquids". Likewise, in claim 3 "a plurality of different gas or liquid material" is non-idiomatic and indefinite, and in claim 4, "a plurality of gas or liquid" is non-idiomatic, unclear and indefinite. It is noted that in the amendment file May 16, 2007, applicants have already corrected this same defect in claim 1, line 12, and the same correction must be made for all occurrences. In claim 4, line 3 the phrase "the source having a plurality of gas or liquid" lacks proper antecedent basis and is unclear because claim 1 defines "a source of gas" and "a source of liquid" and it is unclear which previously defined source is being referenced. Also in claim 4, it is unclear if the recited "plurality of gas sources" are the same or different from the

Art Unit: 1763

recited "source of gas" of claim 1 which is described as optionally comprising a plurality of different gases. In claim 4, lines 6 and 7, the phrase "each source of the different types of liquid" is unclear, vague and indefinite because it implies that a plurality of liquid sources are present but claims 1 and 4 do not recite plural liquid sources. Instead, claims 1 and 4 recite "a source of liquid" in the singular. In claim 7, the scope of the phrase "comprises a plurality of different materials consisting of one of the respective gas and liquid" is unclear, vague and indefinite. In particular, the use of "comprises" and "consisting of" together in this manner causes the scope of the claim to be unclear. Also, the phrase "comprises a plurality" conflicts with "consisting of one". Also, it is unclear what the word "respective" is intended to refer to in the phrase "one of the respective gas and liquid". In claim 16, lines 13-15, the phrase "for deposition in process chamber connected to the passageway in a flow path subsequent introduction of the flow of gas through the passageway" is unclear, vague and indefinite. In particular, the intended meaning of "subsequent introduction" is unclear, vague and indefinite. Also, "the" should be inserted prior to "process chamber".

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

Art Unit: 1763

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10, 12 and 14-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yamoto (WO 03/079421). Yamoto (EP 1492159) is a patent family equivalent of Yamoto (WO 03/079421), and Yamoto (EP 1492159) will be used in this office action as an English translation of Yamoto (WO 03/079421). Yamoto (see Fig. 1, for example) discloses a vaporization system including an outer housing (formed by tube 20 in combination with part 102) defining a vaporization chamber, a heated surface member (the inner surface of tube 20) in the vaporization chamber, an atomizer having a liquid inlet and gas inlet, a source of liquid connected to the liquid inlet, a source of gas connected to the gas inlet, and at least one of the sources comprising a plurality of different gases and/or liquids as claimed. The gas and liquid sources of Toda include both plural gas sources (see Fig. 21, for example) and plural liquid sources.

Claims 1-10, 12 and 14-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yoshioka (7,163,197). Yoshioka discloses a vaporization system including an outer housing defining a vaporization chamber, a heated surface member (see member 62 of Figs. 45 and 46, for example) in the vaporization chamber, an atomizer having a liquid inlet and gas inlet, a source of liquid connected to the liquid inlet, a source of gas connected to the gas inlet, and at least one of the sources comprising a plurality of different gases and/or liquids as claimed. Regarding claim 13, the embodiments of Figs. 44 and 46 of

Art Unit: 1763

Yoshioka provide an atomizer with a plurality of passageways therethrough, each of the passageways being connected to receive a different gas from the first source

Claims 1-10, 12 and 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka (7,163,197) taken in view of Yamoto (WO 03/079421). To the extent that these claims could be interpreted to require a source of plural gases of differing chemical composition, it would have been obvious to provide plural gases of differing chemical composition in the apparatus of Yoshioka, because Yamoto (Fig. 21) teaches that it is desirable to provide a source of both oxygen and argon.

Claims 1-10, 12 and 14-17 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Paz de Araujo (6,511,718). Paz de Araujo (see Figs. 1 and 2) discloses a vapor deposition system comprising a process chamber connected to a vaporization chamber. The vaporization chamber has a heated surface portion, a first source of gas for introduction into the vaporization chamber through a connecting passageway, the first source having a plurality of different gaseous materials (121-123) selectively introduced into the passageway and a second source of precursor liquid material (111-113) connected to the passageway. Regarding the limitation of "subsequent introduction" in claim 16, the timing of the introduction of the gas and liquid is a process limitation and the present apparatus claims are not so limited by such a process limitation. Regarding claims 3 and 4, it is noted that Paz de Araujo teaches that each liquid source (111-113) contains a mixture of liquids of different chemical compositions (i.e. precursor and solvent).

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paz de Araujo (6,511,718) taken in view of Sun (6,409,839). Sun discloses a vaporization system for vaporizing material carried in a gas stream that is analogous to that of Paz de Araujo. Sun teaches (see Fig. 7) that it is desirable to provide separate tanks of liquid (precursor and solvent) connected to the liquid source line, so that the liquid source line can be cleaned with solvent. It would have been obvious to connect two liquid source tanks to the liquid source line of Paz de Araujo in order to provide cleaning solvent to keep the liquid source line lean as taught by Sun.

Claims 1, 3, 7-12, 16 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sun (6,409,839). Sun (see Fig. 7) discloses a vaporization system for vaporizing material carried in a gas stream, including a housing defining a vaporization chamber, a heated surface member in the vaporization chamber (see Fig. 8), an atomizer having a liquid inlet and a gas flow inlet (see Fig. 7, for example), wherein the source of liquid comprises a plurality of liquids as illustrated in Fig. 7. Regarding claim 16, it is noted that Sun teaches (see col. 6, lines 11-29) that some of the liquid vaporizes in the atomizing chamber, and therefore the atomizing chamber is a source of plural gases (i.e. carrier gas and gasified precursor) and also a source of liquid.

Claims 2, 4, 5, 6, 7-12 and 14-17 are rejected under 35 U.S.C. 103 as obvious over Sun (6,409,839) taken in view of Paz de Araujo (6,511,718). Paz de Araujo discloses a vaporization system for vaporizing material carried in a gas stream that is analogous to that of Sun. Paz de Araujo teaches (see Figs. 1 and 2 and col. 10, lines

Art Unit: 1763

57-66) that it is desirable to connect plural gas source to the inlet of an atomization chamber and it would have been obvious to do so in the apparatus of Sun, in view of the teachings of Pas de Araujo.

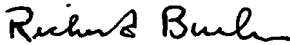
Claims 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshioka (2002/00432215) in view of Dornfest (6,082,714). Yoshioka (see Fig. 15, for example) discloses a vaporization system including a vaporization chamber receiving an aerosol from an atomizer, the aerosol comprising gas and liquid droplets from first and second respective gas and liquid sources, at least one of the sources comprising a plurality of different individually selectable material, said vaporization chamber including a housing defining a vaporization chamber having an inlet and an outlet, and a heated member comprising a first block. Yoshioka doesn't disclose a heated block having the structure recited in claims 22-27. Dornfest (see Fig. 15) discloses a vaporization system analogous to that of Yoshioka, and Dornfest also teaches the use of a heated metal block for vaporizing an atomized liquid. The heated block 188 of Dornfest includes a plurality of passageways between fins 178, and a bore aligned with the inlet of the vaporization chamber as claimed. Dornfest's vaporization chamber also includes a second block 186 having passageways as recited in claim 26. Recirculation as recited in claim 25 would be inherent at least some degree in the vaporization chamber of Dornfest. It would have been obvious to one skilled in the art to combine the atomizer of Yoshioka with the vaporization chamber and heated block design of Dornfest, because Dornfest teaches that his design successfully vaporizes an atomized liquid as desired by Yoshioka.

Art Unit: 1763

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Richard Bueker
Primary Examiner
Art Unit 1763